Analysis of Data in Numerical Towing Tank Model Tests

The International Maritime Organization emphasizes on safer ships and cleaner oceans, which could be achieved only through reasonably accurate predictions of maneuverability of a vessel well in advance of its operation in waterways. As we are well aware, the model testing facilities for maneuverability assessments are rare and prohibitively expensive. As alternate resort Computational Fluid Dynamics (CFD) techniques have emerged as a promising tool in helping the designer comprehend the complex flow around the hull as well as determine the loads on the same during maneuvering motions. CFD unlike experiments uses an entirely different approach in the analysis and interpretation of simulated data. A method has been developed to determine the hydrodynamic derivatives in maneuvering motions. It encompasses selection of a mathematical model, accomplishing numerical simulations through prescribed motions and developing expressions for the determination of the hydrodynamic derivatives through analysis of simulated results. This lecture focuses on the analysis of data in different stages of dynamic CFD simulations for reliable maneuverability assessments.